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Ultrafine aerosol measurements at different levels in an Arctic Site

The Arctic environment is well known to be particularly sensitive to perturbations of the radiative budget. During these last years both temperature increases and sea ice extent reduction are observed. The reason for these Arctic variation relates to both the complex feedbacks that are active in this polar region as well as the overall arctic environmental conditions.

Since aerosol particles are active on perturb the radiative balance of the Arctic environment in different ways, various studies are devoted to investigate the behaviors and characteristics of aerosol in Arctic.

Routinel year-round ultrafine size distribution measurements are performed since 2000 at the Zeppelin station, located 470 m asl. in the Svalbard Island (78.9°N, 11.9°E), using a Differential Mobility Particle Sizer (DMPS) from 6 nm up to 900 nm. Since 2010, similar measurements along the spring and summer season are performed at the Gruvebadet Lab facility (70 m asl) located at the foot of the Zeppelin station. The experimental set up, a TSI Scanning mobility particle sizer (SMPS) model 3034, gives the size distribution from 10 nm up to 487 nm. Measurements performed at two different levels should able us to better define the aerosol ultra fine population characteristics inside the boundary layer, its seasonal behavior (the well-known haze period, characterized by a dominating accumulation mode, and the summer period, marked by a relative dominance of smaller particles), and the relative influence of long distant transported natural or anthropogenic aerosols, but also to better quantify the influence of local sources, e.g. cruise ships.

Analogies and differences at the two stations will be presented, together with the result of an intercomparison campaign held in the spring 2013, together with the results of the intercomparison. In addition, relationship between the ultrafine number size distribution at the two levels, the new particles formation events and the boundary layer behavior is investigated

Working group IAS (WG1, WG2, WG3) o sessione speciale (SPR)

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